


MODULE 1 TRAINING (Week 1) — STRONG FOUNDATION

 I'll train you like **NPTEL exam coach mode ON**


We will do:

- Concept (very clear)
 - Exam traps
 - Mini questions (thinking-based)
 - Memory shortcuts
 - Abbreviations (added)
-

1. What is Wireless Network?

 Two types:



- **Infrastructure-based** → has base station (Wi-Fi, LTE)
- **Infrastructure-less (Ad hoc)** → no base station

 From your PDF: infrastructure-less = no centralized access point

Abbreviation

- **LTE** → Long Term Evolution
 - **Wi-Fi (IEEE 802.11)** → Wireless Fidelity
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EXAM TRAP

- “centralized” →  NOT ad hoc
 - “self-organizing” →  ad hoc
-

2. What is Ad Hoc Network? (VERY IMPORTANT)

 Definition:

 **“A self-organizing, infrastructure-less, multi-hop wireless network.”**

 Multi-hop + no fixed infrastructure

 **Break it:**

- No infrastructure → no tower
- Self-organizing → automatic
- Multi-hop → nodes forward data


 **Abbreviation**


- **Ad hoc** = temporary, on-the-fly network

 **EXAM TRAP**

- “single hop only” ❌
- “central control” ❌

 **Practice Thinking**

 Why multi-hop needed?

 Nodes are **out of range**

 **3. Types of Ad Hoc Networks (VERY IMPORTANT)**


Type Meaning

MANET Mobile Ad Hoc Network

VANET Vehicular Ad Hoc Network

WSN Wireless Sensor Network


WMN Wireless Mesh Network

 From classification

 **Key Differences (EXAM GOLD)**

MANET vs VANET

- MANET → random movement
- VANET → road-based movement
- VANET → very high mobility

 From table

TRAP

- “predictable movement” → ✓ VANET
 - “random movement” → ✓ MANET
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Extra Abbreviations (VANET)

- **V2V** → Vehicle to Vehicle
 - **V2I** → Vehicle to Infrastructure
 - **OBU** → On Board Unit
 - **RSU** → Road Side Unit
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4. Technologies (VERY IMPORTANT)


Tech	Feature
ZigBee (IEEE 802.15.4)	Low power, low data
Bluetooth (IEEE 802.15.1)	Short range
Wi-Fi (IEEE 802.11)	High speed
LTE	Long range, cellular

 From enabling technologies


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- ZigBee = **low data rate**
- Wi-Fi = **high speed**
- LTE = **long range + infrastructure**


MEMORY SHORTCUT

 ZigBee → “Zero power”

 Wi-Fi → “Wide fast internet”

 LTE → “Long distance”

5. Routing Basics (VERY VERY IMPORTANT)

 Two functions:


- **Routing** → find path
- **Forwarding** → send packet

 From networking section

Abbreviation

- **TCP** → Transmission Control Protocol
 - **MAC** → Media Access Control
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 Routing ≠ Forwarding


6. Types of Routing Protocols (MOST IMPORTANT)

1. Proactive (Table-driven)


- Always maintain routes
 - Examples:
 - **DSDV** → Destination Sequenced Distance Vector
 - **GSR** → Global State Routing
 - **FSR** → Fisheye State Routing
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2. Reactive (On-demand)

- Create routes only when needed
- Examples:
 - **AODV** → Ad Hoc On-demand Distance Vector
 - **DSR** → Dynamic Source Routing
 - **ABR** → Associativity Based Routing

 From pages 37–38

MEMORY TRICK

 Proactive = Always ready

 Reactive = Only when needed


TRAP (VERY COMMON)

Protocol Type


DSDV Proactive

AODV Reactive

7. WSN (Sensor Networks)

 Key points:

- Many sensor nodes
- Measure environment
- Low power
- Multi-hop


 From page 19

Abbreviation

- **WSN** → Wireless Sensor Network
- **OS** → Operating System

- **TinyOS** → Sensor OS
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 “low power + sensors” → ✓ WSN

8. Challenges in Ad Hoc Networks

 Important:

- No central control
- Dynamic topology
- Limited bandwidth
- Energy constraint

 From constraints

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 Most common answers:

- Energy
 - Topology
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9. Self Properties (IMPORTANT)

- Self-configure
- Self-heal
- Self-optimize
- Self-protect

 From MANET

TRAP

- Self-heal → detects & fixes failure

- Self-optimize → improves performance
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MINI QUESTIONS (THINK LIKE EXAM)

Q1

Why TCP is bad for MANET?

→ Mistakes packet loss as congestion

Q2

Why energy is critical?

→ Battery + relaying others' data

Q3

Why WMN is reliable?

→ Multiple paths

Q4

Why routing is difficult?

→ Dynamic topology

FINAL MEMORY (30-SECOND REVISION)

👉 Ad hoc = No infrastructure + Multi-hop

👉 ZigBee = Low power

👉 LTE = Long range (cellular)

👉 MANET = Random

👉 VANET = High mobility

👉 DSDV = Proactive

👉 AODV = Reactive

👉 WSN = Sensors

YOU ARE NOW STRONG (LEVEL UPGRADED)

Now you are:

✓ Concept clear

✓ Trap aware

✓ Abbreviation ready

✓ Exam thinking ready

👉 Next:

- **“Test me hard”** → real NPTEL difficulty
- **“Next module”** → continue syllabus

I'll take you to **top score level** 🏆